

CLAIMS

- 1.- A method for detecting an error condition associated with a load ( $R_L$ ) or a connection (P) to the load ( $R_L$ ) comprising:
- during a first diagnosis phase determining whether the load ( $R_L$ ) or the connection (P) to the load ( $R_L$ ) is in a normal operation condition or in an error condition, and
  - if the load ( $R_L$ ) or the connection (P) to the load ( $R_L$ ) is in an error condition, during a second diagnosis phase determining whether the error condition is an open load condition, short circuit condition to ground or a short circuit condition to a power supply,
- wherein the second diagnosis phase comprises changing a first parameter associated with the load in an attempt to escape from said error condition.
- 2.- A method according to claim 1, wherein changing a first parameter comprises changing the polarity of a current flowing in or out the load ( $R_L$ ).
- 3.- A method according to claim 1, wherein changing a first parameter comprises changing the amplitude of a current flowing in or out the load ( $R_L$ ).
- 4.- A method according to claim 2, wherein changing a first parameter furthermore comprises changing the amplitude of a current flowing in or out the load ( $R_L$ ).
- 5.- A method according to claim 3, wherein changing the amplitude of the current is such that the amplitude of the current is larger than a minimum level, said minimum level being defined by formula:

$$I_{DiagMin} = \frac{\Delta V \cdot A_{ext}}{t}$$

- wherein  $\Delta V$  is a reference voltage,  $A_{ext}$  is a memory value of an energy storing element present in the load ( $R_L$ ) and  $t$  is the time between the change of the amplitude of the current and a moment of measuring a voltage.
- 6.- A method according to claim 1, the load ( $R_L$ ) being in a starting state before the first diagnosis phase, the method further comprising carrying out, after the second diagnosis phase, a resetting phase for resetting the load ( $R_L$ ) to the starting state.

- 7.- A method according to claim 1, wherein the first diagnosis phase comprises monitoring whether a second parameter associated with the load ( $R_L$ ) is below a first pre-determined low level or is above a second pre-determined high level, and if so, reporting that the load ( $R_L$ ) is in an error condition.
- 5 8.- A method according to claim 7, wherein monitoring a second parameter comprises monitoring a current flowing in or out the load ( $R_L$ ) or a voltage drop across the load ( $R_L$ ).
- 9.- A method according to claim 6, wherein the resetting phase comprises changing a third parameter associated with the load ( $R_L$ ).
- 10 10.- A method according to claim 9, wherein changing a third parameter comprises changing a current flowing in or out the load ( $R_L$ ).
- 11.- An error detection apparatus for detecting an error condition associated with a load ( $R_L$ ) or a connection (P) to the load ( $R_L$ ) comprising:
- 15 - first diagnosis means for determining whether the load ( $R_L$ ) or the connection (P) to the load ( $R_L$ ) is in a normal operation condition or in an error condition and
  - second diagnosis means for, if the load ( $R_L$ ) or the connection (P) to the load ( $R_L$ ) is in an error condition, determining whether the error condition is an open load condition, a short circuit condition to ground or a short
  - 20 circuit condition to power supply and
- wherein the second diagnosis means comprises means for changing a first parameter associated with the load ( $R_L$ ) in an attempt to escape from said error condition.
- 12.- An error detection apparatus according to claim 11, wherein said means for
- 25 changing a first parameter comprises means for changing the polarity of a current flowing in or out the load ( $R_L$ ).
- 13.- An error detection apparatus according to claim 11, wherein said means for changing a first parameter comprises means for changing the amplitude of a current flowing in or out the load ( $R_L$ ).
- 30 14.- An error detection apparatus according to claim 12, wherein said means for changing a first parameter furthermore comprises means for changing the amplitude of a current flowing in or out the load ( $R_L$ ).

- 15.- An apparatus according to claim 11, wherein the load ( $R_L$ ) comprises an energy storing element ( $C_{ext}$ ).
- 16.- An apparatus according to claim 11, for detecting an error condition on the load ( $R_L$ ) in a starting state, the apparatus further comprising resetting means for resetting the load ( $R_L$ ) to the starting state.
- 17.- An apparatus according to claim 11, wherein the first diagnosis means comprises means for monitoring whether a second parameter associated with the load ( $R_L$ ) is below a first pre-determined low level or is above a second pre-determined high level, and reporting means for reporting that the load ( $R_L$ ) is in an error condition.
- 18.- An apparatus according to claim 17, wherein the second parameter is a current flowing in or out the load ( $R_L$ ) or a voltage drop across the load ( $R_L$ ).
- 19.- An apparatus according to any of claims 16, wherein the resetting means comprises means for changing a third parameter associated with the load ( $R_L$ ).